triadis

Altair RU

Owner's Manual

Document name:	AtrRU-EN
Document version:	0.3
Release date:	25/03/2009

triadis engineering GmbH – Eichholzstrasse 7 – Postfach – CH-3254 Messen
Phone: +41 (0)31 768 15 15 – Fax: +41 (0)31 768 15 16 – Internet: www.triadis.ch – E-Mail: admin@triadis.ch

General Information

Document identification / revision status

This manual applies to the following Altair part numbers:

- P/N 276-000 (Altair RU)

triadis engineering GmbH reserves the right to update this manual as product enhancements are made throughout the life of this product.

Actual version: **Altair RU Owner's Manual • AtrRU-EN, Version 0.3**

Version history

Revision	Date	Status	Author	Changes, comments
0.1	25/02/2009	draft	S.Gisiger	Initial Draft
0.2	28/02/2009	draft	D.Wettstein	Translation, layout
1.0	25/03/2009	first release	D.Wettstein	minor edits

Safety notices

The Altair RU documentation is an essential component of the equipment and should carefully be stored with the aircraft log book.

- The safety notices must be observed, in particular attention must be given to |*notes* and ||***warnings***.
- Improper installation or misuse of Altair RU may result in degraded performance of Altair RU or to equipment to which it is connected.

Legal notices

- This manual, the instrument software and firmware, and user interface design are Copyright 2006-2009 by triadis engineering GmbH .
- Any decompiling, disassembly, reverse engineering, or modification of the instrument or firmware are strictly prohibited without specific written permission from triadis engineering GmbH .
- triadis engineering GmbH will not be liable for errors/omissions in this document.
- The owner and/or the business performing the installation is responsible for ensuring that the Altair installation conforms to the requirements of the aircraft type and the installation is done professionally in accordance with this manual.

Contents

1 Introduction **1**
1.1 Package content . . . 1
1.2 Description . . . 1

2 Installation **2**
2.1 General . . . 2
2.2 GPS antenna . . . 2
2.3 Communication . . . 2

3 Getting started **3**
3.1 Connecting the GPS antenna . . . 3
3.2 Connection with Altair glide computer . . . 4
3.3 Configuration . . . 4
3.4 USB Stick . . . 5

4 Use Altair RU **6**
4.1 Pilot information and task declaration . . . 6
4.1.1 Use with Altair glide computer . . . 6
4.1.2 Use with a PC . . . 6
4.1.3 Use with a PDA . . . 6
4.2 Read out flight logs . . . 6

5 Integration with an Altair glide computer **7**
5.1 XCSoar . . . 7
5.1.1 Configuration and Information . . . 7
5.1.2 Declaring tasks . . . 9
5.2 Altair Maintenance . . . 10
5.2.1 Altair Flight Recorder Setup . . . 10

6 Physical Security **12**
6.1 FAI Approval . . . 12
6.2 Calibration . . . 12

7 Technical specifications **13**
7.1 Connectors . . . 14
7.1.1 Data connector . . . 14
7.1.2 Interface Connector . . . 14
7.2 Indicator . . . 14

A Double-seater installation **17**

1 Introduction

1.1 Package content

- Altair Flight Recorder Unit
- Connector cable to Altair glide computer
- GPS antenna

> ***The document "IGC-APPROVAL FOR GNSS FLIGHT RECORDER - Triadis Altair V1.0" is an integral content of this manual. The instructions in that document therefore have to be observed.***

1.2 Description

The Altair Flight Recorder Unit (Altair RU) is a flight recorder which records the following flight informations:

- GPS-Position/-Track
- ENL (Engine noise level)
- Height

These informations (flight records) are saved in the flight recorder. The saved records can be transferred (read out) afterwards via a RS232-Interface. There are two possibilities to do so:

- via the tool AltRuTool on a PC
- via the Altair glide computer (flights are transferred to a USB Memory Stick)

Altair RU needs the Altair glide computer only to transfer data. Apart of that, the recorder is totally independent and may be used as a standalone device.

2 Installation

2.1 General

Altair RU should be installed in a place protected from humidity and extreme temperature differences (protected from direct sunlight).

2.2 GPS antenna

Mount the GPS antenna in a place with free sky view. An ideal place could be the glare protection.

2.3 Communication

Altair RU has an IGC RJ45-Interface. Data is sent in NMEA format NMEA-0813. The standard configuration is a connection with the Altair glide computer.

3 Getting started

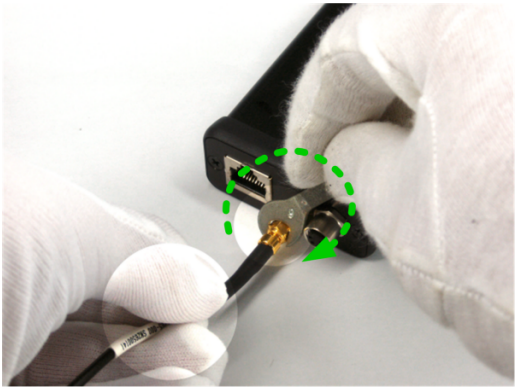
This chapter only describes the most important steps which are necessary to get started when using Altair RU with an Altair glide computer. More detailed information is available in the following chapters.

3.1 Connecting the GPS antenna

First connect the GPS antenna to Altair RU. Procede in two steps:

- Plug the cable into the connector on Altair RU and push it as far as possible (1-2mm).

- Fasten the cable on the connector as shown in the picture. To avoid damages, make sure the cable is not twisted.



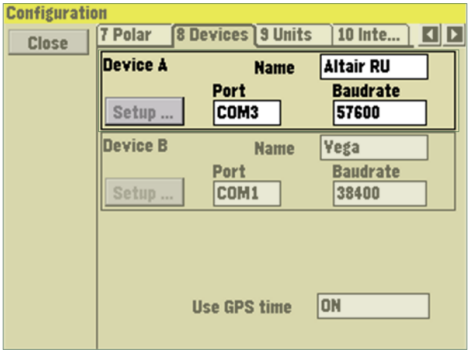
3.2 Connection with Altair glide computer

Connect Altair RU to the Altair glide computer via the cable included in the package.
The configuration should look as shown in the picture below.

3.3 Configuration

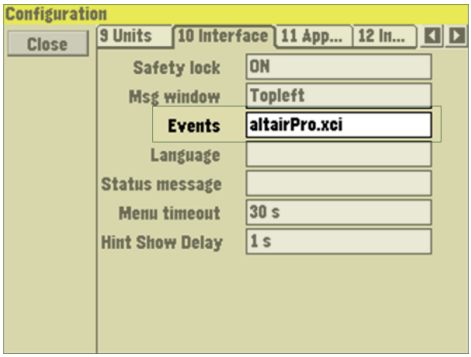
As soon as the devices are connected, the configuration has to be set.

- Open the configuration settings in XCSoar (CONF > Setup System), go to tab 8 and set the following values:



  - Device A: Altair RU
  - Port: Com 3
  - Baudrate: 57600

- Additionally, the ”Events” field in tab 10 has to be set to altairPro.xci.



Altair RU should now be ready to use with an Altair glide computer.

3.4 USB Stick

Make sure the directory \\USBStick\Altair\logs exists on your USB drive. If not, create it manually. Without this directory, the automatic download of flights will not work.

4 Use Altair RU

4.1 Pilot information and task declaration

4.1.1 Use with Altair glide computer

When Altair RU is connected to an Altair glide computer, tasks and pilot informations can be declared to the glide computer. For more information, see the Altair Maintenance documentation.

4.1.2 Use with a PC

When Altair RU is connected to a PC, it is possible to change some configuration settings and to read out flights via the PC application AltRuTool (Altair Recoder Unit Tool, see specific documentation).

4.1.3 Use with a PDA

Altair RU has a FLARM compatible interface and can be connected to a PDA to use it with SeeYou, Strepla or similar programmes.

4.2 Read out flight logs

Through the Altair glide computer it is possible to read out the recorded flights manually or automatically (at every system start or shutdown) and to save these flights on an USB flash drive (\\USBStick\Altair\logs).

This is designed to make it possible to automatically read out the newest flights and save them in IGC format on an USB Memory Stick.

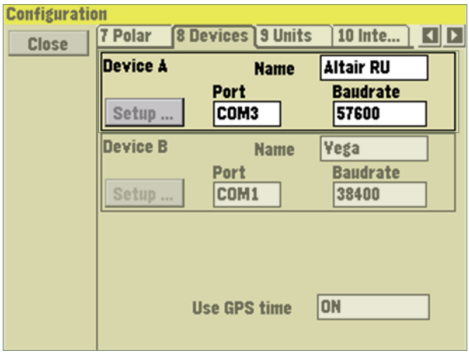
5 Integration with an Altair glide computer

5.1 XCSoar

5.1.1 Configuration and Information

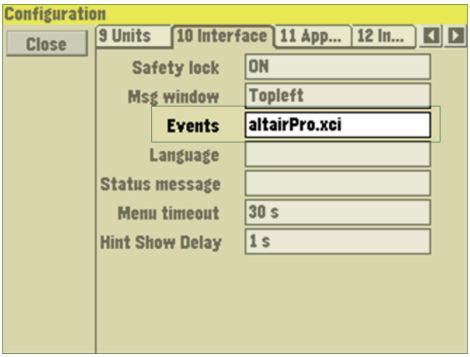
First configuration in XCSoar

When Altair RU is used in combination with an Altair glide computer, the configuration settings have to be modified in XCSoar. To do so, open the XCSoar configuration settings and go to tab 8 (for more information, see the XCSoar documentation). The settings for a double-seater installation are described in appendix A.



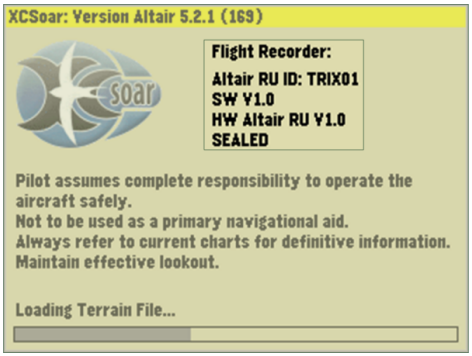
- set Device A to Altair RU
- Port: Com 3
- Baudrate: 57600

In addition to these settings, the data field ”Events” on tab 10 of the configuration files have to be set to altairPro.xci.



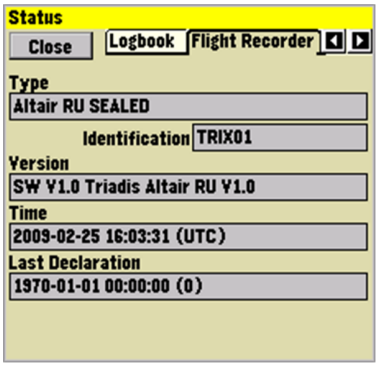
Startup screen

Once the configuration is done, the devices have to be restarted. At startup, you can now see the Altair RU version info on the right of the screen next to the XCSoar logo.


XCSoar: Version Altair 5.2.1 (169)
Flight Recorder:
Altair RU ID: TRIX01
SW V1.0
HW Altair RU V1.0
SEALED
Pilot assumes complete responsibility to operate the aircraft safely.
Not to be used as a primary navigational aid.
Always refer to current charts for definitive information.
Maintain effective lookout.
Loading Terrain File...

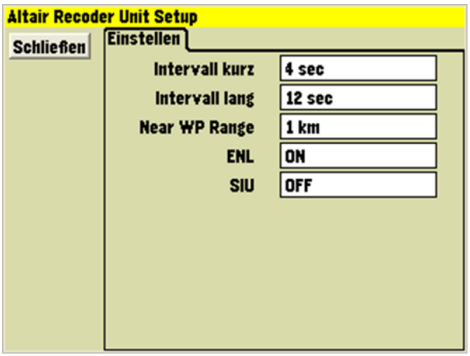
Status

Status info about Altair RU are also available in the status dialog (INFO ¿ show status).



Setup

Settings such as intervals, SIU or ENL can be specified in the Altair RU setup dialog (via CONF ¿ Setup Logger).

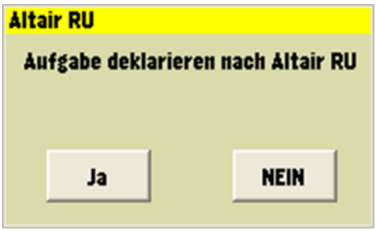


5.1.2 Declaring tasks

Tasks can be declared to Altair RU in XCSoar (for more info, see the XCSoar documentation). To do so, open the task editor (via NAV ¿ task edit).

The tasks can be saved and/or declared viea Save declare .

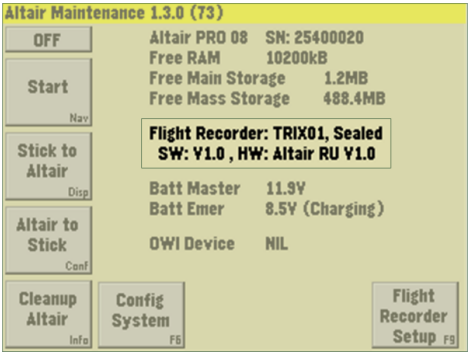
If Download declare was clicked, you are asked to confirm your choice.



If you confirm, the following confirmation is displayed:

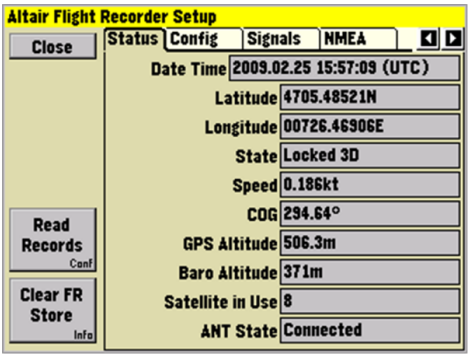
5.2 Altair Maintenance

As an alternative to XCSoar, the Altair RU informations are available via Altair Maintenance. Altair Maintenance automatically opens, when the Altair glide computer is started with an USB Memory Stick plugged in. On this page, the version informations of Altair RU are displayed as follows.



5.2.1 Altair Flight Recorder Setup

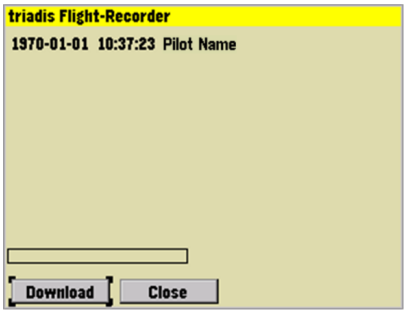
On the Altair Maintenance page, you can open the setup dialog for Altair RU by pressing Flight Recorder Setup or F9.



Only some basic functions are described here. For more details about this dialog, see the Altair Maintenance documentation.

Read out flights

In addition to the automatic readout of flights, you can manually read out the newest flights by pressing Read Records . The following dialog is opened:



The selected flights can be downloaded to an USB Memory Stick by pressing Download .

6 Physical Security

6.1 FAI Approval

Altair RU is approved by the FAI for ”all flights”. For more information, see the document ”IGC-APPROVAL FOR GNSS FLIGHT RECORDER - Triadis Altair V1.0”.

> ***Do not open Altair RU or the electronic seal will be destroyed immediately and the IGC sealing will become invalid. Due to that, the following flights can not be validated anymore.***

6.2 Calibration

Altair RU has a calibration certificate for the built-in pressure sensor. This calibration is valid for two years. If needed, you have to do a recalibration after two years. For more information, see the document ”IGC-APPROVAL FOR GNSS FLIGHT RECORDER - Triadis Altair V1.0”.

7 Technical specifications

Mechanical Data

• Dimensions	86 x 57 x 26 mm
• Weight	150g
• Mounting	Dual lock

Indicator

• Red LED, wave length	660nm

Interface

• Protocol	NMEA-0813 with proprietary extensions
• Serial comms	RS-232 57600 baud, 8N1

Power Supply

• Operating Voltage	12V DC (8-16) VDC
• Consumption	35 mA typical at 12VDC, 200mA while charging the Battery.
• Battery	Li-Ion, 7.4V 720mAh, internally not connected to the FR!

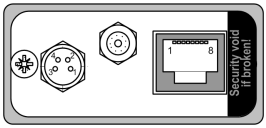
- Over-voltage protection, which disconnects the device from the power source if the input voltage exceeds 16V.
- Input voltage over 30V will blow the internal fuse. Reverse voltage protected up to -30V.

Environmental

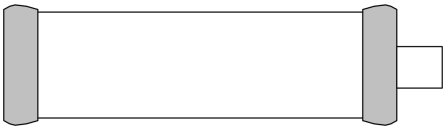
• Temperature and Altitude Test Procedure	DO160E Section 4, Device meets requirements for Class D1.
• Operating temperature	-20 to +55 degrees C
• Short time operating temperature	-40 to +70 degrees C
• Storage temperature	-55 to +85 degrees C
• Battery Charging	0 to 40 degrees C
• Altitude	15'000m
• Humidity	10-90 % non-condensing
• Shock resistance	Drop from 1m to hard wood plate.
• Vibration resistance	NA

Front view

Back view



Side view



7.1 Connectors

7.1.1 Data connector

RJ45, 8pin, IGC Layout.

Pins

1,2	GND
3	RX (RS232 Data to Recorder)
4	TX (RS232 Data from Recorder)
5	7.5V LiIon Battery
6	7.5V LiIon Battery
8,7	12V (35-200mA)

7.1.2 Interface Connector

M8 Industrial Sensor Connector.

Pins

1(bn)	12V
2(wt)	EVENT (12V active)
3(bl)	GND
4(bk)	spare (reserved for further use)

() : cable wire color

7.2 Indicator

Red LED

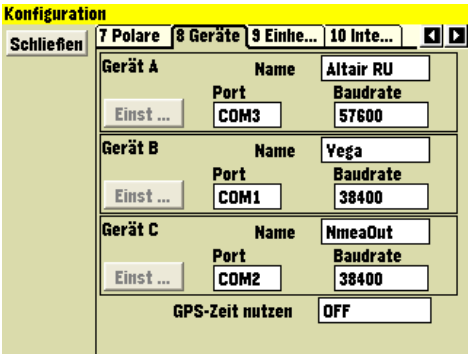
Signals:

Continuously OFF	No Power or System Error
Continuously ON	System Checking, System Error, Seal Broken, Downloading
Blinking 1Hz	Ready, GPS acquiring
Short Flashing 2.5sec	Read, GPS locked, on ground (recorder expect takeoff)
Short Flashing 5sec	Read, GPS locked, flying (recorder recording)

A Double-seater installation

For a double-seater installation, the values in tab 8 of the configuration settings have to be set to the following values:

Master:



Device A

- Name: Altair RU
- Port: COM3
- Baudrate: 57600

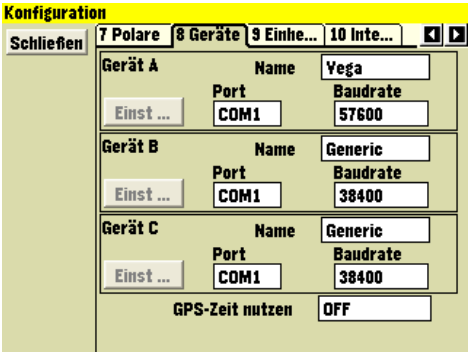
Device B

- Name: Vega
- Port: COM1
- Baudrate: 38400

Device C

- Name: NmeaOut
- Port: COM2
- Baudrate: 38400

Slave:



Device A

- Name: Vega
- Port: COM1
- Baudrate: 57600

Device B

- Name: Generic
- Port: COM1
- Baudrate: 38400

Device C

- Name: Generic
- Port: COM1
- Baudrate: 38400